Meeting Date: January 29, 2002
Date Prepared: February 5, 2002

MULTI-AGENCY RADIATION SURVEY AND SITE INVESTIGATION MANUAL (MARSSIM)
WORKGROUP MEETING NOTES

ATTENDEES:

U.S. Environmental Protection Agency - RIE: C. Petullo
U.S. Environmental Protection Agency – Headquarters: K. Klawiter
U.S. Environmental Protection Agency – NAREL: V. Lloyd
U.S. Nuclear Regulatory Commission: R. Meck, G. Powers
U.S. Department of Energy - EML: C. Gogolak
U.S. Navy: S. Doremus
U.S. Army: D. Alberth
U.S. Air Force: R. Bhat

MEMBERS OF THE PUBLIC:

U.S. Army Contractor: G. Falo
Idaho National Engineering and Environmental Lab: L. Hull
Argonne National Laboratory: J. Arnish

DISCUSSION: Agenda and Objectives

The Workgroup started the morning session at 8:30 AM. C. Petullo welcomed the Workgroup members and outlined the agenda and objectives of the meeting. She emphasized that the Workgroup needed to complete clear outlines in order to provide contractors with a clear direction in which to complete MARSAME and MARSASS. She expressed her desire for the Workgroup to produce product and make progress.

K. Klawiter reported that a descriptive catalog of modeling had begun. The Workgroup agreed not to endorse any specific model. The finalized model parameters will occur over the next year, and there was agreement that the parameters and their definitions were pertinent.

C. Petullo suggested MARSSIM be a volume of processes rather than procedures as that approach would be more useful.

DISCUSSION: Status and Updates Relevant to MARSSIM

S. Doremus stated that MARSSIM was being widely adopted by all concerned parties, e.g., DoD, Federal, State and Local Regulators, contractors, politicians, and the general public, at all of the Navy's current decontamination and decommissioning sites.

However, he stated that validating past (or secondary) data was becoming a concern. Often there is official documentation releasing a site, but no supplementary hard data such as survey designs, instrumentation, survey results, etc. He also raised concern about cleanup standards. Sites that were decommissioned 20 or 30 years ago to one standard must now be reevaluated and/or remediated to newer, more restrictive standards. What is the liability when standards change?

The Workgroup discussed the NRC and EPA differences and regulations. There needs to be clarity in which agency's rules should apply in conflicting scenarios.

D. Alberth added that the Air Force (FORCECOM) advises users to go to the MARSSIM Appendix. He stated that he wanted the Workgroup to include more information on processes.

DISCUSSION: Training Status

C. Petullo informed the Workgroup of the upcoming training dates, times and locations. The schedule for the first class begins on April 23, 2002 through April 25, 2002, in Orlando, Florida. The second session dates are May 21, 2002 through May 23, 2002, in Kansas City. The final session will be June 4, 2002 through June 6, 2002 in Seattle Washington.

Initially there was to be a joint training session with the DOE and the NETO, but NETO is no longer in business. She notified the Workgroup that she was the Point of Contact for MARSSIM training. She explained that tuition is free for EPA and state employees and they receive seating priority. The class usually did not fill to capacity and any vacant seats will be available for other federal agencies. She warned the Workgroup that federal employees may not receive free training for MARSSIM next year. She was waiting to find out the need for MARSSIM training within other Agencies and their ability to assist with funding. Additionally, she asked the Workgroup to inquire within their Agencies.

DISCUSSION: Web-Based Technical Conferencing Status

R. Meck informed the Workgroup that the Technical Web-based Conference will monitor and filter comments, consequently the conference will not be in real time. It will be set up like a bulletin board with a short turnaround response time. People will be able to post questions and possibly have other users and an internal expert answer the posted questions. The response person will not be full-time but trained in MARSSIM. This person will be able to use the resources within NRC to answer questions.

K. Klawiter recommended that the Technical Conference page have question parameters posted on the site. The Workgroup determined that conference could serve as a good indicator of field activities and help to identify FAQ's.

C. Petullo noted that the Workgroup could possibly answer questions posted on the Conference page. There was general concern that the Workgroup would become consultants. The Workgroup decided to place this subject on the Conference call agenda.

DISCUSSION: Website Upgrade Presentation

K. Klawiter gave an overhead presentation of the MARSSIM website. She showed test pages and informed the Workgroup that the site would go up soon. The EPA logo was required on the website and the MARSSIM site will have to conform to the EPA template. There was a problem with the FAQ section because the EPA had established published guidelines and a format for FAQ's. The Website has to contain short answers to FAQ's. She informed the Workgroup that she would add the features "last update" and "number of visitors" to the site. The Workgroup established that the Comment section of the site would respond to typographical errors and policy questions and the Technical conference would answer questions on procedures and processes.

The Workgroup began with the Index page and evaluated each page of the entire site. They concluded the website needed the following changes:

1. Include syllabus for the training course on Training page.
2. Note that tuition is free to federal and state employees on Training page.
3. Include a link to COMPASS through ORISE on the Tools page.
4. Change the FAQ names "Technical FAQ's" and "General FAQ's" on Index page.
5. Remove NRC address on Comments page.
6. Check EPA address on Comments page.
7. Change document name to MARSSIM, Revision 1 (with June 2001 updates included) as written on CD.
8. Put in colorful warning symbol on Obtain MARSSIM page.
9. Check historical date for Obtain MARSSIM page.
10. Clarify comments on manual content through written comments and implementation questions through the Technical Conference.
11. Spell out MARSSIM on the Index page.
12. Remove contractor names from "Contact the Workgroup" page.

DISCUSSION: Subsurface Area and MARSAME

R. Meck presented an introduction to a modeling illustration of a Seven Step process for clearing metals. He showed graphs of 1000 DPM's per centimeter for copper, aluminum and concrete.

C. Gogolak suggested adding another step to the Seven Step process in order to include clean materials. In some cases, it is not economically feasible to survey material for release, which by design puts this scenario in another category. He stated that MARSSIM reads explicitly that an HSA can only determine if a material is impacted or non-impacted and further classification of non-impacted materials requires further characterization. He asked what the percentage of survey frequency measured in the Seven Step process.

R. Meck reported that a certain fraction of a batch is scanned 100%. He offered his opinion that survey frequency is empirical. The standards for the Seven Step process are unimportant measurements because they fall within three standard deviations of background and will fall within set standards anyway. He went on to describe the Seven Step process as a higher quality HSA than described in MARSSIM or a hybrid of a QC on an HSA.

The Workgroup discussed the different ways to prove that a material is impacted or non-impacted. Further discussion included determining the criteria needed to decide what material is clean and clearable.

C. Petullo noted that the Workgroup needed a conceptual model of materials to be included in surveys. The Workgroup posed several questions to address in the MARSAME and MARSASS documents such as:

a. How do you demonstrate compliance and release criteria for materials and equipment?
b. How do you determine what is impacted and what is not impacted?

The Workgroup decided to focus the project direction toward addressing impacted vs. non-impacted materials.

PUBLIC COMMENT:

L. Hull stated that HSA data is a problem on sites by definition when there is no information about questionable areas. He suggested the questionable areas should always be Class 3.

G. Falo stated that since sites document monthly surveys, this information would help prove and convince regulators that a particular site is not impacted.

ACTION ITEMS:

C. Petullo will provide DQO's for Web-base objectives to Workgroup by February 8, 2002

Workgroup Conference call agenda item – discuss suggestions for MARSSIM website, K. Klawiter will report the difference between changes and updates

D. Alberth, R. Meck, S. Doremus will investigate linking freeware to MARSSIM website

C. Petullo will provide Rev. 1 August with no updates to K. Klawiter

Workgroup will discuss the adding additional links or downloads to the TOOLS page of the MARSSIM website

C. Petullo will e-mail the training site information and the course syllabus to K. Klawiter

S. Doremus will write the answer to the FAQ on the website: What is a DCGL?

Workgroup needs to define LBGR for the website

Meeting Date: January 30, 2002
Date Prepared: February 5, 2002

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WORKGROUP MEETING NOTES

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MEMBERS OF THE PUBLIC:

U.S. Army Contractor: G. Falo
Idaho National Engineering and Environmental Lab: L. Hull
Argonne National Laboratory: J. Arnish, SY Chen

DISCUSSION: MARSAME Development

The Workgroup started the morning session at 8:30 AM. C. Petullo recapped the previous day's discussion and stated there was a common thread between HSA and MARSSIM but there needed to be a consensus within the Workgroup. She suggested the Workgroup step back from HSAs because of the project's considerable size and insufficient funding. The Workgroup further discussed the possibilities of HSAs taking funds from other projects.

D. Alberth told the Workgroup that he would find out the needs of the Pentagon and Army Corps or Engineers (ACE) and asked what they would like to see in MARSSIM. He said he would inquire about assistance with funding. He advised the Workgroup that he was unable to make a commitment but would find out the needs of the users.

R. Meck recommended the principles and processes be established, put into an outline and turned over to contractors. He said contractors should interact with the Workgroup to discover and understand what the principles, processes and quality of standards will apply to subsurface and materials. He also asserted that the process and procedure focus was not to be prescriptive.

The Workgroup decided to discussed strategies and share ideas on scope and direction. V. Lloyd presented an outline for consideration that included:

1. Process for HSA - determination of impacted or not impacted (documentation of decision process)

   To include and discuss the following:

   a) Existing data
   b) collection and review of information
   c) consensus of regulators (coordination with regulators)
   d) decision criteria and DQOs

2. Materials and Equipment

   a) Non-impacted
   b) existing guidance for impacted
   c) scenarios

3. Subsurface

4. Specifics of processes that get into the QC of field methods and statistical analysis and appropriate use. This guidance would dovetail with Number 1 above. This suggestion would be for about a year and a half from now.

K. Klawiter's suggestion included:

1. MARSSIM
2. MARSAME
3. MARSASS
4. Supplement to all three: HSA

She recommended the Workgroup approach delivering the projects in the order of her outline. The HSA would be completed last and contain more detail than previous deliverables.

The Workgroup decided to review the table of contents from MARSSIM and use it as a template to develop an outline for MARSAME. The Workgroup made additions and deletions to the sections of the MARSSIM's outline. They made preliminary decisions on whether or not each section was relevant to MARSAME's outline.

PUBLIC COMMENT PERIOD

S. Chen pointed out that site release takes on different meanings in the regulatory domain than in the public domain. Public perception is very important and a hot topic. He summarized that the public needs prior knowledge of the process' cost effectiveness. Cost is an important factor and must be determined on the front end, after it has been determined that a material is impacted or not impacted, not after it goes through the

process. MARSAME has a very important cost factor. He suggested the Workgroup consider a user-friendly approach and should be keenly aware of the needs in the field.

C. Gogolak responded by saying that regulators could not consider costs and their function is to give guidance on determinations.

DISCUSSION: MARSAME Development

The afternoon session continued with the Workgroup evaluating the table of contents chapters and sections. After completing a rough draft of the MARSAME outline, a hard copy was printed and the Workgroup again evaluated the preliminary chapters and sections, they also assessed the logic and flow of the outline.

DISCUSSION: Presentation

S. Chen and J. Arnish gave presentation on "Bridging the gap of DCGL and MARSSIM". The discussed a preliminary integration of RESRAD into MARSSIM's framework to facilitate field implementation. It also addressed the issues encountered in the integration process.

MARSAME *DRAFT* Table of Contents

5.11 Laboratory Measurements
Note to Selves: Check MARLAP for special considerations of media other than air/water/soil

6. Interpretation of Survey Results
6.1 Introduction
6.2 Data Quality Assessment
6.2.1 Review the Data Quality Objectives and Sampling Design
6.2.2 Conduct a Preliminary Data Review
6.2.3 Select the Tests
6.2.4 Verify the Assumptions of the Tests
6.2.5 Draw Conclusions From the Data
6.2.6 Example
6.3 Contaminant Not Present in Background
Refer to MARSSIM
6.4 Contaminant Present in Background
Refer to MARSSIM
6.5 Scan to Release
6.6 Evaluating the Results: The Decision
6.6.1 Elevated Measurement Comparison
6.6.2 Interpretation of Statistical Test Results
6.6.3 If the Survey Unit Fails
6.6.4 Removable Activity
6.7 Documentation

References

Appendix A Examples of MARSAME Applied to a Final Status Survey
A.1 Introduction
A.2 Survey Preparations
A.3 Survey Design
A.4 Conducting Surveys
A.5 Evaluating Survey Results
Note to Selves: We should provide two or more examples: volumetric and surface

Appendix B Additional Field Survey and Laboratory Analysis Equipment Specifically Related to Materials and Equipment
H.1 Introduction
H.2 Field Survey Equipment
H.3 Laboratory Instruments

Appendix C Additional Sampling Methods: A List of References Specifically Related to Materials and Equipment
M.1 Introduction
M.2 List of Sources

Glossary

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Meeting Date: January 31, 2002
Date Prepared: February 5, 2002

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U.S. Environmental Protection Agency – NAREL: V. Lloyd
U.S. Environmental Protection Agency – Region 1: S. Mangion
U.S. Environmental Protection Agency – Region 5: T. Drexler, B. Cooper
U.S. Nuclear Regulatory Commission: R. Meck, G. Powers
U.S. Department of Energy - EML: C. Gogolak
U.S. Navy: S. Doremus
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Argonne National Laboratory: J. Arnish

DISCUSSION: Subsurface Roundtable

C. Petullo started the morning session with introductions, agenda and objective overview. She informed the Workgroup that the agenda for Friday was going to be included in the afternoon agenda. The Workgroup decided to take the same approach in the development of MARSASS as they had with MARSAME. Before the evaluation of an outline began, R. Meck wanted to exchange ideas with the Workgroup. V. Lloyd pointed out the need to include the parameters of subsurface materials in the discussion.

C. Petullo started a roundtable discussion on the Workgroup's experiences and observations with subsurface:

S. Mangion told the Workgroup that all available tools are not used properly with respect to site history. He suggested discussing how to use field and analytical tools. He shared his opinion that the problem may be hydrological, geological, and chemistry issues.

D. Alberth said his agency's issues were mainly site-specific and involved radiological risk assessments. He pointed out that it would help to have guidelines in place and would promote better communication with regulators.

C. Gogolak pointed out that is important not to leave hotspots on the surface. Subsurface is different and more difficult. While designing surveys, there is a need for improvement in using MARSSIM. He stated that geostatistical data is uncertain and core sampling is expensive. Therefore, other resources such as geostatistics, process knowledge and HSAs warrant consideration.

B. Cooper's point of view involved the importance of collecting good data to incorporate into modeling. Because models are very complex and contamination data is unpredictable, the solution is to keep things simple. He added that a 3D interpretation method would be a quality plan.

K. Klawiter recommended the Workgroup focus on deciding on the factors that would prove a site is clean. Shrinking the scope would eliminate some of the Workgroup members issues.

The Workgroup discussed the MARSASS outline and flow. Document scope as well as the incorporation of processes was considered. The following outline summarizes the roundtable discussion points:

1. Compliance with criteria
2. Scope
    a. Discrete
    b. Uniform diffuse
    c. Vadose
    d. Groundwater Plumes
    e. Land Fills
    f. Buried Settling ponds
    g. Capping Strategies and restricted access

3. Historical Site Assessment – heavy reliance
4. Geological Problem
    a. Geo
    b. Hydro – 3D
    c. Chemistry
    d. Background risk
5. Sample Design Strategies
    a. Data quality
    b. QA/QC
6. Various Technical for Data Types
7. Use of Field Data Points
    a. Field decisions
8. Uncertainty
9. Cost

The Workgroup agreed to start with very simple concepts and step them up into complex topics. C. Gogolak talked about the scope of MARSASS as it related to the focus on free release vs. restricted release. He thought the MARSASS document would be a template

for free release vs. restricted release and consequently provided clear directions for development.

Since there are a large percentage of free release sites, the consensus of the Workgroup was to limit the scope to free release.

The workgroup decided the purpose of the document would be as follows: Provide Final Status Survey process and design for compliance with dose and/or risk based criteria at present. Compliance can only be demonstrated for this point in time.

The scope of the document will include HSA's role in finding "buried treasures":

1. Subsurface surveys from 15 centimeters to the water table
2. Process knowledge
3. HSA play role in finding "buried treasures"

The Workgroup started the evaluation of the MARSASS table of contents. A copy of the original MARSSIM table of contents was displayed on an overhead and a hard copy of the MARSAME table of contents was given to the Workgroup. The MARSASS content was fleshed out using both MARSSIM and MARSAME as templates. After the first draft for MARSASS was completed, the Workgroup added side notes to some sections and chapters in an effort to give the contractors a better idea of the groups intent for the subject matter.

DISCUSSION: Wrap-up

The workgroup created agendas for the next conference call scheduled for February 11, 2002. C. Petullo asked B. Cooper and T. Drexler to attend MARSSIM training and continue to help with the development of MARSASS. She reviewed the upcoming training sessions in Orlando, Kansas City and Seattle. She raised the question of needing a third supplement. R. Meck suggested that a third supplement could possibly be composed into a later project.

The workgroup discussed the link to the MARSSIM website. It was decided that a keyword search be added to the website and an acknowledgement that other sources exist. The Workgroup did not want to endorse any particular software. In addition, links will not be included on the site because websites are dynamic and the Workgroup did not feel it would be possible to ensure the quality of where the user would be sent nor the quality of the site.

C. Petullo gave a two-year strategy plan for the development of the MARSAME and MARSASS documents:

1. Develop documents
2. Internal (peer) review – approximately 6 months, possible 3 months for MARSASS
3. Receive, file and classify comments – 3 classifications

    a. Editorial
    b. Technical
    c. Policy
4. Prepare document for public comment – 3 month goal
5. Concurrent with #4, EPA Science Advisory Board review and invite other agencies to participate in EPA SAB
6. Comment period – process same as #3
7. Prepare document for release
8. Goes for final publication

ACTION ITEMS:

CONFERENCE CALL: Monday, February 11, 2002, 3:00 P.M. to 4:30 P.M. EST.

1. MARSSIM web conferencing – discuss format and process
2. Discuss web-base quality objectives and suggestions for the site
3. Update impacted area definition
4. Review new LBGR write up

C. Petullo will reserve lines for February 11, 2002 conference call.

APRIL MEETING: Will be held in Washington D.C. on April 16, 2002 through April 19, 2002.

C. Petullo will contact R. Meck on February 14, 2002 to find out status of the contract

K. Klawiter will write LBGR in active voice and send to C. Petullo

C. Petullo will distribute the new LBGR write up to the Workgroup and gather responses

S. Doremus will write the answer to the FAQ on the website: What is a DCGL?

C. Petullo will draft DQO's for what the Workgroup wants the Teleconferencing site to do for the Workgroup itself and others. This draft will assist in defining the scope and purpose of the site. She will forward the DQO to R. Meck on Friday, February 8, 2002.

MARSASS *DRAFT* Table of Contents

3.6 Identify Survey Volumes
3.7 Select Instruments and Survey Techniques
3.7.1 Selection of Instruments
3.7.2 Selection of Survey Techniques
3.7.2.1 Conventional Surveys
3.7.2.2 Scanning Surveys
3.7.3 Criteria for Selection of Sample Collection and Direct Measurement Methods (Preliminary considerations only, including cross-contamination, detection limits, etc. See later sections)
3.8 Site Preparation
3.8.1 Consent for Survey
3.8.2 Property Boundaries
3.8.3 Physical Characteristics of Site
3.8.4 Clearing to Provide Access
3.8.5 Reference Coordinate System
3.9 Ways to Make Holes in the Ground (Access for Sampling or Measurement)
3.10 Special Considerations for Quality Control of Subsurface Soils
3.10.1 Measurement Quality Objectives
3.10.2 Number of Quality Control Measurements
3.10.3 Controlling Sources of Error
3.11 Health and Safety (Significant Concerns – repeat from MARSSIM)

4. Survey Planning and Design
4.1 Introduction
4.2 Scoping Surveys
4.2.1 General
4.2.2 Survey Design
4.2.3 Developing an Integrated Survey Strategy
4.2.4 Evaluating Survey Results
4.2.5 Documentation
4.3 Characterization Surveys
4.3.1 General
4.3.2 Survey Design
4.3.3 Developing an Integrated Survey Strategy
4.3.4 Evaluating Survey Results
4.3.5 Documentation
4.4 Remedial Action Support Surveys
4.4.1 General
4.4.2 Survey Design
4.4.3 Developing an Integrated Survey Strategy
4.4.4 Evaluating Survey Results
4.4.5 Documentation
4.5 Final Status Surveys
4.5.1 General
4.5.2 Survey Design
4.5.3 Developing an Integrated Survey Strategy

4.5.4 Evaluating Survey Results
4.5.5 Documentation

5. Special Considerations for Field Measurement Methods and Instrumentation of Subsurface Soils (additions separate from MARSSIM – some sections may drop out if all material is covered in MARSSIM)
5.1 Introduction
5.2 Data Quality Objectives
5.2.1 Identifying Data Needs
5.2.2 Data Quality Indicators
5.3 Selecting a Service Provider to Perform Field Data Collection Activities
5.4 Measurement Methods
5.4.1 Direct Measurements
5.4.2 Scanning Surveys
5.5 Radiation Detection Instrumentation
5.5.1 Radiation Detectors
5.5.2 Display and Recording Equipment
5.5.3 Instrument Selection
5.5.4 Instrument Calibration
5.6 Data Conversion
5.6.1 Radionuclide Concentration and Exposure Rates
5.7 Detection Sensitivity
5.7.1 Direct Measurement Sensitivity
5.7.2 Scanning Sensitivity
5.8 Measurement Uncertainty (Error)
5.8.1 Systematic and Random Uncertainties
5.8.2 Statistical Counting Uncertainty
5.8.3 Uncertainty Propagation
5.8.4 Reporting Confidence Intervals
5.9 Special Equipment
5.9.1 Positioning Systems
5.9.2 Mobile Systems with Integrated Positioning Systems
5.9.3 Radar, Magnetometer, and Electromagnetic Sensors

6. Special Considerations for Sampling and Preparation for Laboratory Measurements of Subsurface Soils (See Section 5 notes)
(Possibly coring, compositing, cross-contamination, references to MARLAP)
6.1 Introduction
6.2 Sampling
6.2.1 Subsurface Soil
6.3 Field Sample Preparation and Preservation
6.3.1 Subsurface Soil

7. Interpretation of Survey Results
7.1 Introduction
7.2 Data Quality Assessment